PB-217 936

WATER QUALITY SURVEY OF NORTHEAST RIVER, ELK RIVER, C & D CANAL, BOHEMIA RIVER, SASSAFRAS RIVER AND UPPER CHESAPEAKE BAY, SUMMER 1968

Federal Water Pollution Control Administration
Annapolis, Maryland

1968

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PB 217 936

[redacted] WATER QUALITY SURVEY

OF

[redacted] POTOMAC RIVER, ROCK CREEK, C & D CANAL, SCHUYLKILL RIVER, DELAWARE RIVER AND UPPER CHESAPEAKE BAY

[redacted] 1963

[redacted] DATA REPORT

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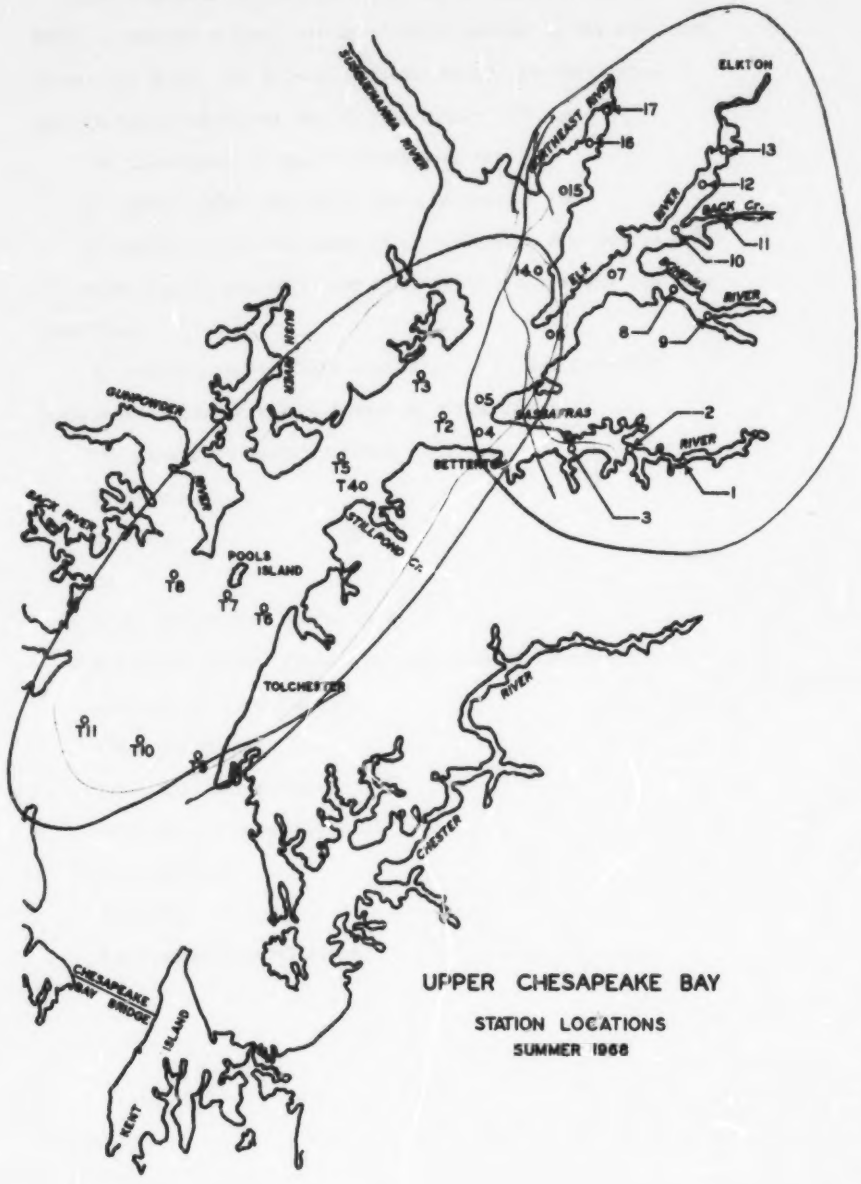
Middle Atlantic Region
FWPCA
Department of the Interior



UPPER CHESAPEAKE BAY

STATION LOCATIONS

SUMMER 1968

I. INTRODUCTION

The Chesapeake Field Station of the Middle Atlantic Region, FWPCA, conducted a field survey of water quality in the Northeast River, Elk River, C & D Canal, Bohemia River, Sassafras River and the upper Chesapeake Bay in late summer 1968.

The objectives of these cruises were to:

1. assess water quality in these waters;

2. estimate standing crops of phytoplankton and observe areas of rooted aquatic plants in the tributaries under summer low flow conditions;

3. evaluate, under field conditions, a Yellow Springs Instrument Company portable dissolved oxygen meter.

The parameters measured were:

Temperature

Salinity

pH

Light extinction, Secchi disk

Dissolved oxygen (field meter and Winkler titrations)

Biochemical oxygen demand

Total phosphorus

Total Kjeldahl nitrogen

Oxidized nitrogen (NO_2 + NO_3)

Chlorophyll a

Turbidity

Phytoplankton populations

II PROCEDURES

A. Sampling and field observations

Temperature was measured *in situ* with a YSI thermistor which was integral with the 50' *in situ* dissolved oxygen probe.

One gallon samples were retrived from just below the surface and at one intermediate depth (usually 15') by means of a submersed 12 volt modified bilge pump with plastic impeller and housing, connected with ½" garden hose to the boat. The final orifice of the garden hose was modified with reducing adapters to accomodate ¼" tubing for filling of conventional 300 ml oxygen bottles.

pH was determined aboard the vessel with a Beckman N-1 meter, from an aliquot of the gallon sample.

The gallon samples were iced in portable coolers and returned to the laboratory at Annapolis for further analyses.

B. Chemical analyses

1. Dissolved oxygen was determined by the azide modification of the Winkler method on samples fixed in the field, and titrated potentiometrically at the laboratory in Annapolis with a Fisher automatic "Titralyzer". (Reference: Standard Methods for the Examination of Water and Wastewater, 12th ed. 1965)

In situ oxygen determinations were also made with the Yellow Springs Instrument Company Model 54RC portable dissolved oxygen meter. The probe was calibrated at each station by the empirical values of dissolved oxygen in saturated air supplied with the instructions for the instrument.

2. Biochemical Oxygen Demand was determined, with no dilutions or seeding, by the procedure outlined in Standard Methods. One initial D.O. and duplicate final 5 day D.O. determinations were made, with the Winkler titrations as cited above.

3. Turbidity was determined with a Hach photoelectric nephelometer, calibrated in Jackson Turbidity Units.

4. Salinity was determined with calibrated hydrometers.

5. Light extinction, in inches, was made with a 12" (30 cm) white Secchi disk.

6. Total phosphorus (expressed as mg/l PO_4) was determined by the persulfate procedure described by D.W. Mensel and N. Corwin ("The Measurement of Total Phosphorus in Sea Water Based on the Liberation of Organically Bound Fractions by Persulfate Oxidation", Limnology and Oceanography 10:280-282, 1965.)

Phosphate was measured colorimetrically with the procedure outlined by J. Murphy and J. P. Riley ("A Modified Single Solution Method for the Determination of Phosphate in Natural Waters", Analytica Chimica Acta, 27:31-36, 1962.)

7. Oxidized nitrogen (NO_2+NO_3), expressed as NO_3-N, was determined by the Cd-Cu reduction column as described by E.D. Wood, F. A. J. Armstrong and F. A. Richards ("Determination of Nitrate in Sea Water by Cadmium-Copper Reduction to Nitrite", J. Marine Biological Assoc. U. K. 47:23-31, 1967.)

8. Total Kjeldahl Nitrogen (TKN) was determined by the procedure outlined in Standard Methods. This method included NH_3-N in the results.

9. Chlorophyll a was determined by extraction of Millipore-filtered samples in 90% acetone and read spectrophotometrically, as outlined by Strickland and Parsons ("A Manual of Sea Water Analysis", 2nd edition, revised, Fisheries Research Board of Canada, Bulletin 125, Ottawa, 1965.)

10. Phytoplankton populations were identified and counted in a Sedgwick-Rafter counting chamber. Diversity indices were calculated by a method described by R. Margalef "Temporal Succession and Spatial Heterogeneity in Phytoplankton" in Perspectives in Marine Biology edited by Buzzatti-Traverso, University of California Press, Berkeley, 1958.

III STATION LOCATIONS

1. Sassafras River, at Georgetown Bridge
2. Sassafras River, Nun Buoy "6"
3. Sassafras River, Can "3", Ordinary Point
4. Sassafras River, mouth, off Betterton
5. Chesapeake Bay, off Grove Point Buoy "1"
6. Elk River at Turkey Point, Bucy N "6"
7. Elk River at confluence with Bohemia River, Bucy N "10"
8. Bohemia River at Long Point, Bucy N "2"
9. Bohemia River at Georges Point
10. Elk River at confluence with C & D Canal, Bucy "19"
11. Chesapeake and Delaware Canal, Bucy N "26"
12. Elk River at Paddy Piddles Cove, Bucy N "6"
13. Elk River off Locust Point, Bucy N "14"
14. Northeast River channel off Rocky Point, Bucy R "2"
15. Northeast River off Roach Point, Bucy N "10"
16. Northeast River off Charlestown, Bucy N "8"
17. Northeast River at mouth of Northeast Creek

T1. Sassafras River, mouth, off Betterton (same as Station 4)
T2. Chesapeake Bay, off Sassafras River, north of channel between N "26" and N "2"
T3. Chesapeake Bay, Bucy N "2" at Spesutie Island channel
T4. Chesapeake Bay, Bucy N "22" off Still Pond Creek
T5. Chesapeake Bay, Bucy C "1" off Romney Creek
T6. Chesapeake Bay, Bucy "12" off Fairlee Creek
T7. Chesapeake Bay, Bucy C "3", lower tip Pooles Island
T8. Chesapeake Bay, Bucy S41B, off Gunpowder River
T9. Chesapeake Bay, Bucy R "6" above Swan Point
T10. Chesapeake Bay, between Bucy C "5" and S "18B"
T11. Chesapeake Bay, off Craighill channel light

CRUISE NARRATIVE

August 27, 1968 - Wind was NW, 2-4 mph at start of cruise. Tide was very low. Previous night had been the first comparatively cool night after a 10-day hot spell.

The Sassafras River at Georgetown was green with algae, like split-pea soup, especially in the shallower waters. This scum of blue-green algae was no longer evident at Station 2.

Wind increased to 15-20 mph, Bay was rough.

Many clumps of wild celery (Vallisneria) adrift in the mouth of the Elk River by Turkey Point.

In the Bohemia River, stringy, slimy green algae (Spirogyra) were evident at both stations. Scotchman's Creek had exceptionally clear water, with all details of the bottom clearly definable in 3 feet of water, in contrast to all other areas of the cruise.

Waters in the C & D Canal were a peculiar gray color, in contrast to the obvious green color throughout the cruise.

Conversation with a marina operator by Station 13 in Elk River indicated severe bloom conditions had existed in previous two weeks, but was much improved at time of visit.

1968

CHESAPEAKE FIELD STATION

HEAD OF THE CHESAPEAKE BAY STUDY

Comparison of Yellow Springs Instrument Company Dissolved Oxygen Meter with Winkler Determinations Under Field Conditions

Station Number	Date Sample Taken	Time Sample Taken	Sample Depth Feet	DO Winkler mg/l	DO YSI Meter mg/l	Discrepancy
1	8-27	0800	Surface	6.45	6.95	+0.5
			12	6.19	6.8	+0.61
2	8-27	0830	Surface	6.45	5.95	-0.5
3	8-27	0845	Surface	6.99	7.3	+0.31
			15	6.23	6.7	+0.47
4	8-27	0902	Surface	7.42	7.4	0
			10	7.34	7.4	+0.06
5	8-27	0914	Surface	7.58	8.0	+0.42
			15	7.34	8.2	+0.86
6	8-27	0940	Surface	7.16	7.2	+0.04
			15	7.31	7.85	+0.54
7	8-27	1000	Surface	6.20	6.65	+0.45
			15	6.02	6.6	+0.58
8	8-27	1012	Surface	7.34	7.8	+0.46
			10	7.17	7.7	+0.53
9	8-27	1027	Surface	7.24	7.5	+0.26
			15	7.15	7.5	+0.35
10	8-27	1121	Surface	6.27	6.4	+0.13
			15	6.21	6.45	+0.24
11	8-27	1132	Surface	6.37	6.65	+0.28
			15	6.30	6.7	+0.40
12	8-27	1148	Surface	6.15	6.3	+0.15
			5	6.27	6.2	0
13	8-27	1230	Surface	7.59	6.7	-0.89
			5	7.24	6.5	-0.74
14	8-27	1515	Surface	8.16	8.0	-0.16
15	8-27	1500	Surface	8.44	8.3	-0.14
16	8-27	1450	Surface	7.62	7.55	-0.07
17	8-27	1440	Surface	7.27	6.9	-0.37
Range	-0.89 to +0.86		n = 29	$\bar{x}$ = 0.16		4.77
1	8-28	1425	Surface	10.71	10.+	0
			15	6.70	6.8	+0.10
2	8-28	1410	Surface	8.97	9.2	+0.23
			13	8.51	8.5	0
3	8-28	1340	Surface	8.54	8.65	+0.11
			15	7.74	7.9	+0.16
4	8-28	1335	Surface	8.62	8.0	-0.62
			10	8.15	7.6	-0.55
5	8-28	1330	Surface	7.94	7.2	-0.74
			15	8.03	7.25	-0.78
6.	8-28	0955	Surface	6.30	6.15	-0.15
7	8-28	1005	Surface	6.59	7.1	+0.51
8	8-28	1020	Surface	7.63	8.1	+0.47
9	8-28	1030	Surface	8.32	9.1	+0.78
10	8-28	1105	Surface	7.02	6.9	-0.12
			15	6.69	6.5	-0.19
11	8-28	1135	Surface	6.90	6.9	0
			15	6.55	6.5	0
12	8-28	1115	Surface	6.01	5.85	-0.16
13	8-28	1120	Surface	8.83	8.9	+0.07
14	8-28	0945	Surface	7.73	7.75	+0.02
			15	7.62	7.5	-0.12
15	8-28	0935	Surface	8.27	8.4	+0.13
			8	8.28	8.1	-0.18
16	8-28	0915	Surface	6.26	6.3	+0.04
			10	5.68	6.0	+0.32
17	8-28	0900	Surface	5.91	6.5	+0.59
Range	-0.78 to +0.78		n = 27	$\bar{x}$ = -0.003		-0.08

1968
CHESAPEAKE FIELD STATION
HEAD OF THE CHESAPEAKE BAY STUDY
PHYTOPLANKTON POPULATIONS

	Station 1	Station 3	Station 5	Station 9	Station 11	Station 13	Station 14	Station 17	Station T1	Station T3	Station T5	Station T6	Station T11
Blue-green algae													
1. Coccoid													
Anacystis	6035	4357	9040	4101	6058	8691	10,205	4264	722	1934	2540	489	419
2. Filamentous													
Anabaena	2423	163	23		140	513	46		140	117	396	489	93
Oscillatoria	44,410	4707	2936		117	1118	2819	1305	4450	3122	3775	2773	70
Green algae													
1. Coccoid													
Actinastrum	47	23	23		23					23			
Closterium	280	47											
Pediastrum	93	93				93	93	23					
Scenedesmus	163	47	70			93	70			23	23	23	
Micractinium		23											
Tetraedron			23	70	47	47	23	23		70	23		
Schroederia			23			47							
Chlorella			23				47						
Ankistrodesmus								23		23	47	23	
Staurastrum											23		
Oocystis												23	
2. Filamentous													
Spirogyra		47											
Ulothrix zonata						47	47	163		233	163		

	Station 1	Station 3	Station 5	Station 9	Station 11	Station 13	Station 14	Station 17	Station T1	Station T3	Station T5	Station T6	Station T11
Green flagellates													
Chlamydomonas	769	326	140		47	396	93	233	70	93	186	17	
Euglena						23		23			163		23
Diatoms													
1. Centric													
Cyclotella	47	23					93	47			70		
Stephanodiscus			47										
2. Pennate													
Nitzschia	350	93			23	93							
Asterionella	23						23						
Navicula			23							23			
Total live algae	54,640	14,656	12,348	4171	6455	11,161	13,979	6104	5382	5661	7409	3937	605
Diversity index, $d = \frac{S-1}{\ln N}$	0.916	1.147	1.062	0.684	1.074	1.074	1.050	0.918	0.349	1.042	1.122	0.725	0.468

S = number of species
N = number of individuals

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1968
CHESAPEAKE FIELD STATION
HEAD OF THE CHESAPEAKE BAY STUDY

Sample Number	Date Sample Taken	Time Sample Taken	Sample Depth Feet	Water Temp °C	Salinity °/°°	Secchi Disk Inches	Field pH	Total P mg/l PO_4	TKN mg/l N	NO_2+NO_3 mg/l NO_3-N	Turbidity JTU	Chlorophyll a µgm/l	DO YSI Meter mg/l	DO Winkler mg/l	BOD mg/l
					Station 1 - Sassafras River, Bridge at Georgetown										
68082801	8-27	0800	Surface	27	0	10	7.1	.727	2.940	.009	14.9	257.25	6.95	6.45	> 10.62
			5	27									6.85		
			12	26.5									6.8	6.19	
2901	8-28	1425	Surface	26.5		12		.523	2.688	.053	22	237	10.0	10.71	> 10.50
			5	26.5									9.5		
			15	26									6.8	6.70	
3001	8-29	1335	Surface	25		13		.582	2.118	.080	24	162		9.75	8.96
			10											6.70	
					Station 2 - Sassafras River, Mun 6										
68082802	8-27	0830	Surface	27	0	14	6.9	.340	1.568	.023	9.5	144.75	5.95	6.45	8.97
			5	26.75									5.8		
			15	26										6.09	
2902	8-28	1410	Surface	26		18		.240	1.338	.036	13	123	9.2	8.97	9.07
			5	26									9.0		
			13											8.51	
			14	26									8.5		
3002	8-29	1315	Surface	25		23		.214	.850	.024	12	21		9.23	4.98
			10											7.83	

01

Sample Number	Date Sample Taken	Time Sample Taken	Sample Depth Feet	Water Temp °C	Salinity °/°°	Secchi Disk Inches	Field pH	Total P mg/l PO_4	TKN mg/l N	NO_2+NO_3 mg/l NO_3-N	Turbidity JTU	Chlorophyll a µgm/l	DO YSI Meter mg/l	DO Winkler mg/l	BOD mg/l
					Station 3 - Sassafras River, Can 3										
68082803	8-27	0845	Surface	26.5	0	28	6.7	.127	.819	N D	6.5	58.50	7.3	6.99	5.26
			5	26.5									7.3		
			15	26									6.7	6.23	
2903	8-28	1340	Surface	25		28		.120	.822	.042	11	46.50	8.65	8.54	4.33
			5	25.5									7.85		
			15	25.5									7.9	7.71	
			25	25									7.85		
3003	8-29	1300	Surface	24		40		.099	.405	.021	8	40.50		7.83	2.80
			10											7.50	
					Station 4 - Sassafras River, off Betterton										
68082804	8-27	0902	Surface	26	0	34	7.15	.102	.787	.047	5.4	51	7.4	7.42	4.07
			5	26									7.4		
			10	25.5									7.4	7.34	
2904	8-28	1335	Surface	25.5		40		.075	.580	.034	21	39.75	8.0	8.62	3.17
			5	25.5									8.0		
			10	25									7.6	8.15	
3004	8-29	1250	Surface	24		36		.078	N D	.006	6	29.25		8.54	1.91
			10											7.93	
					Station 5 - Bay, Midway between Nun 2 and Bell 1										
68082805	8-27	0914	Surface	26.5	0	32	7.35	.098	.768	.032	5.5	43.50	8.0	7.58	3.42
			5	26.5									8.1		
			15	26									8.2	7.34	
2905	8-28	1330	Surface	25.5		34		.086	.605	.034	15	42	7.2	7.94	2.92
			5	26									7.2		
			15	26									7.25	8.03	
			25	25.5									7.25		
3005	8-29	1245	Surface	25		40		.084	.320	.141	7	35.25		8.44	1.93
			10											7.83	

N D - Not detectable

Sample Number	Date Sample Taken	Time Sample Taken	Sample Depth Feet	Water Temp °C	Salinity °/°°	Secchi Disk Inches	Field pH	Total P mg/l PO_4	TKN mg/l N	NO_2+NO_3 mg/l NO_3-N	Turbidity JTU	Chlorophyll a µgm/l	DO YSI Meter mg/l	DO Winkler mg/l	BOD mg/l
					Station 6 - Bay, Turkey Point, Mun 6										
68082806	8-27	0940	Surface	26.5	0	24	7.2	.104	.940	.059	8.9	44.25	7.2	7.16	3.88
			5	26									7.2		
			15	25.5									7.85	7.31	
2906	8-28	0955	Surface	25.5		24		.061	.584	.154	14	17.25	6.15	6.30	2.27
			5	26									6.1		
			15	26									6.0		
			25	26									6.0		
3006	8-29	0930	Surface	25		24		.100	.307	.201	12	103.5		6.31	1.49
					Station 7 - Elk River, Mun 10										
68082807	8-27	1000	Surface	27	0	28	6.7	.080	.610	.196	8	17.25	6.65	6.20	2.78
			5	26.5									6.5		
			15	26.5									6.6	6.02	
2907	8-28	1005	Surface	25		26		.065	.548	.289	16	2.25	7.1	6.59	1.93
			5	25.5									7.1		
			15	25.5									6.9		
			25	26									6.9		
3007	8-29	0940	Surface	24		33		.055	.301	.365	12	40.5		6.58	.94
					Station 8 - Bohemia River, Mun 2										
68082808	8-27	1012	Surface	25.5	0	14	6.9	.149	1.225	.082	12.5	70.5	7.8	7.34	6.06
			5	25.5									7.7		
			10	25.5									7.7	7.17	
2908	8-28	1020	Surface	23.5		15		.113	.490	.120	17	37.5	8.1	7.63	4.02
			5	24									7.7		
3008	8-29	0955	Surface	23		22		.131	.601	.081	15	18.75		7.58	2.61
			10											6/47	

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Sample Number	Date Sample Taken	Time Sample Taken	Sample Depth Feet	Water Temp °C	Salinity °/°°	Secchi Disk Inches	Field pH	Total P mg/l PO_4	TKN mg/l N	NO_2+NO_3 mg/l NO_3-N	Turbidity JTU	Chlorophyll a µgm/l	DO YSI Meter mg/l	DO Winkler mg/l	BOD mg/l
Station 9 - Bohemia River, above bridge															
68082809	8-27	1027	Surface	25	0	20	6.85	.187	1.156	.203	11.5	128.25	7.5	7.24	6.75
			5	25									7.5		
			15	25									7.5	7.15	
2909	8-28	1030	Surface	23		18		.190	1.236	.062	22	103.5	9.1	8.32	6.39
			4	23.5									8.6		
			5	23.5											
3009	8-29	1005	Surface	23		15		.285	1.111	.018	21	15		8.82	6.78
Station 10 - Elk River, Can 15															
68082810	8-27	1121	Surface	26	0	19	6.6	.122	.508	.235	10.2	12.75	6.4	6.27	2.29
			5	26									6.4		
			15	26									6.45	6.21	
2910	8-28	1105	Surface	25		28		.046	.567	.410	14	11.25	6.9	7.02	1.79
			5	25									6.7		
			15	25.5									6.5	6.69	
			25	25.5									6.4		
3010	8-29	1030	Surface	24		36		.060	.255	.713	8	141.75		6.96	.62
			15											6.52	
Station 11 - C and D Canal, Num 26															
68082811	8-27	1132	Surface	27	0	22	6.8	.056	.654	.087	10	21.75	6.65	6.37	2.46
			5	26.5									6.6		
			15	26.5									6.7	6.30	
2911	8-28	1135	Surface	25		26		.076	.637	.457	13	15.75	6.9	6.90	2.06
			5	25.5									6.6		
			15	25.5									6.5	6.55	
			25	26											
3011	8-29	1205	Surface	25		27		.198	.209	.656	22	21		2.98	NSQ
			15											6.84	

NSQ - Not sufficient quantity

Sample Number	Date Sample Taken	Time Sample Taken	Sample Depth Feet	Water Temp °C	Salinity °/°°	Secchi Disk Inches	Field pH	Total P mg/l PO_4	TKN mg/l N	NO_2+NO_3 mg/l NO_3-N	Turbidity JTU	Chlorophyll a µgm/l	DO YSI Meter mg/l	DO Winkler mg/l	BOD mg/l
					Station 12 - Elk River, Mun 6										
68082812	8-27	1148	Surface	26	0	24	6.5	.098	.641	.229	10	11.25	6.3	6.15	2.24
			5	26									6.2	6.27	
2912	8-28	1115	Surface	23.5		22		.069	.949	.171	18	.75	5.85	6.01	1.70
3012	8-29	1040	Surface	22		45		.084	N D	.835	7	15		7.66	1.09
					Station 13 - Elk River, Mun 14										
68082813	8-27	1230	Surface	25.5	0	15	6.85	.212	.921	.258	14	78	6.7	7.59	4.76
			5	25									6.5	7.24	
2913	8-28	1120	Surface	23		14		.223	.911	N D	29	140.25	8.9	8.83	6.20
			5	23									8.8		
3013	8-29	1050	Surface	23		22		.160	.784	.220	14	59.25		8.17	3.85
					Station 14 - Northeast River, Mun 2										
68082814	8-27	1515	Surface	26.5	0	24	8.3	.144	.629	.008	8.5	60	8.0	8.16	3.96
			5	26									7.9		
			15	26									7.9		
2914	8-28	0945	Surface	24		19		.135	.745	N D	17	66	7.75	7.73	3.61
			5	24.5									7.5		
			15	24									7.5	7.62	
3014	8-29	0920	Surface	23		21		.151	.654	.006	18	87.75		8.05	2.58
			15											7.79	
					Station 15 - Northeast River, Mun 10											
68082815	8-27	1500	Surface	25.5	0	15	8.2	.200	.489	.029	14	52.50	8.3	8.44	4.66
			5	25.5									8.2		
2915	8-28	0935	Surface	23		16		.181	.841	N D	18	72	8.4	8.27	5.01
			5	23.5									8.3		
			8											8.28	
			9	23.5									8.1		
3015	8-29	0905	Surface	22		15		.324	.549	.006	15	66.75		8.12	3.11
			10											8.03	

N D - Not detectable

#1

Sample Number	Date Sample Taken	Time Sample Taken	Sample Depth Feet	Water Temp °C	Salinity */**	Secchi Disk Inches	Field pH	Total P mg/l PO_4	TKN mg/l N	NO_2+NO_3 mg/l NO_3-N	Turbidity JTU	Chlorophyll a µgm/l	DO YSI Meter mg/l	DO Winkler mg/l	BOD mg/l
					Station 16 - Northeast River, Mun 18										
68082816	8-27	1450	Surface	25.5	0	13	7.5	.273	.940	.006	15	72	7.55	7.62	5.47
			5	25.5									7.1		
			10	25.5									7.0		
2916	8-28	0915	Surface	24		10		.227	1.153	N D	43	60	6.3	6.26	4.45
			5	24									6.05		
			10	24									6.0		
3016	8-29	0855	Surface	23		10		.390	.784	.012	23	111.75		5.47	3.41
			12											6.74	
					Station 17 - Northeast River, mouth of creek										
68082817	8-27	1440	Surface	27	0	15	7.1	.234	1.219	.019	14.5	53.25	6.9	7.27	6.24
2917	8-28	0900	Surface	24.5		20		.176	1.185	N D	25	49.75	6.5	5.91	4.31
3017	8-29	0845	Surface	23		15		.197	.941	.006	22	53.25		5.76	2.60

N D - Not detectable

1968
CHESAPEAKE FIELD STATION
HEAD OF THE CHESAPEAKE BAY TRANSECTS

Sample Number	Date Sample Taken	Time Sample Taken	Sample Depth Feet	Water Temp °C	Secchi Disk Inches	Field pH	Total P mg/l PO_4	TKN mg/l N	NO_2+NO_3 mg/l NO_3-N	Turbidity JTU	Chlorophyll a µgm/l	DO Winkler mg/l	BOD mg/l
				Station T-1 Sassafras River, off Betterton									
68090301	9-3	1040	Surface	24	42	6.74	.079	.420	.013	4.4	18.75	8.97	2.89
02			10			6.74	.064	.019	.047	2.6		6-67	2.10
				Station T-2 Bay, North of channel, between N 2 and N 4									
68090303	9-3	1100	Surface	23.5	38	7.04	.104	.191	.036	5.2	28.50	8.85	3.47
04			15			6.70	.096	.592	.022	6.0		6.52	2.09
				Station T-3 Bay N 2, Entrance Spesutie Narrows channel									
68090305	9-3	1112	Surface	23.6	34	-	.233	.828	.003	6.3	27	8.58	NSQ
				Station T-4 Bay Buoy 22, off Still Pond									
68090306	9-3	1140	Surface	24	40	6.77	.102	.618	.018	4.3	23.25	9.21	2.97
07			15			6.47	.096	.777	.016	4.7		6.23	2.58
08			25			6.53	.109	.822	.016	4.5		6.28	2.48
				Station T-5 Bay Buoy C 1, off Romney Creek									
68090309	9-3	1205	Surface		40	6.67	.104	.521	.021	4.6	26.25	8.92	3.21
10			15			6.66	.100	.491	.013	6.4		7.72	2.81
				Station T-6 Bay Buoy 12, off Fairlee Creek									
68090311	9-3	1302	Surface		100	6.58	.049	.313	.019	2.0	7.50	6.93	1.81
12			15			6.66	.084	.301	.042	2.7		6.54	NSQ
13			25			6.75	.068	.374	.025	3.9		5.72	1.74

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Sample Number	Date Sample Taken	Time Sample Taken	Sample Depth Feet	Water Temp °C	Secchi Disk Inches	Field pH	Total P mg/l PO_4	TKN mg/l	NO_2+NO_3 mg/l NO_3-N	Turbidity JTU	Chlorophyll a µgm/l	DO Winkler mg/l	BOD mg/
				Station T-7 Bay Buoy C 3, lower tip Pooles Island									
68090314	9-3	1323	Surface		60	6.63	.102	.429	.075	4.5	12.75	6.81	NSQ
15			15			6.56	.128	.380	.045	4.0		6.56	3.25
16			30			6.58	.090	.288	.050	5.0		6.05	2.20
				Station T-8 Bay Buoy S41B, between Pooles Island and mouth of Gunpowder River									
68090317	9-3	1340	Surface		156	6.63	.039	.301	.075	1.5	4.50	7.88	NSQ
18			10			6.40	.043	.258	.085	1.0		6.90	1.43
				Station T-9 Bay Buoy R6									
68090319	9-3	1410	Surface		72	6.82	.050	.264	.027	2.0	4.50	8.86	2.08
20			15			6.78	.417	1.663	.016	2.7		7.72	>9.26
21			30			6.89	.062	.552	.003	2.0		2.64	1.68
				Station T-10 Bay, between C 5 and S 18B									
68090322	9-3	1425	Surface		48	6.93	.060	.380	N D	2.8	5.25	9.36	1.75
23			15			6.78	.091	.270	N D	2.0		6.47	1.66
				Station T-11 Bay, off North Point Light									
68090324	9-3	1445	Surface		84	6.68	.088	L A	.079	1.1	18.75	8.47	2.02
25			10			6.59	.062	.252	.075	1.5		7.85	2.11

L A - Laboratory accident
N D - Not detectable
NSQ - Not sufficient quantity